REMARKS

This communication is a full and timely response to the aforementioned Office Action dated February 13, 2009. By this communication, claims 1, 2, 6, 7, 11, 12, 14 and 15 are amended. Claims 3-5, 8-10, 13 and 16-25 are not amended and remain in the application. Thus, claims 1-25 are pending in the application. Claims 1, 6, 11 and 14 are independent.

Reconsideration of the application and withdrawal of the rejections of the claims are respectfully requested in view of the following remarks.

I. Rejections Under 35 U.S.C. § 112

Claims 1, 6, 11, and 14 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description and enablement requirements.

Applicants respectfully submit that these rejections are not supportable and appear to be improperly based on an *in haec verba* interpretation of 35 U.S.C. § 112, first paragraph, in which the subject matter of a claimed invention is not believed to be supported unless it is described word-for-word in the specification. It is well-settled that the subject matter of a claimed invention need not be described literally in the specification. See MPEP 2163.02. Rather, Applicants respectfully submit that the feature of "independent of a determination of whether another large block in the image data is a halftone dot region" is supported in and enabled by the disclosure of the specification and drawings, for at least the reasons presented in section I (e.g., pages 11-13) of the Amendment filed on December 15, 2008.

Nevertheless, the rejections of claims 1, 6, 11 and 14 are believed to be moot because the above-quoted feature that formed the basis for the Office's rejection has been deleted from claims 1, 6, 11 and 14. The deletion of this feature is not to be interpreted as an acquiescence to the rejections of these claims under 35 U.S.C. § 112, first paragraph.

II. Rejections Under 35 U.S.C. § 103(a)

A. Claims 1-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohuchi (U.S. Patent No. 5,025,481) in view of Kingetsu et al. (U.S. Patent No. 6,268,935, hereinafter "Kingetsu").

Without acquiescing to these rejections, independent claims 1, 6, 11 and 14 have each been amended to emphasize distinctions between the claimed invention and the applied references. Applicants respectfully submit that the claimed invention is patentable over the applied references for at least the following reasons.

The amendments to claims 1, 6, 11 and 14 are supported throughout the specification and drawings. See, for example, paragraph [0031] on pages 11 and 12 of the specification, and Figure 2.

Exemplary embodiments of the present invention provide an apparatus and method that minimize deterioration in output image quality by appropriately distinguishing the attributes of image areas, particularly halftone-dot regions, and performing processing properly suited to such areas.

As illustrated in Figure 1, for example, an exemplary embodiment[1] of the present invention provides an image processing apparatus comprising a region determination unit 2, which includes a character determination unit 3 and a halftone-dot determination unit 4. As illustrated in Figure 2, for example, the halftone-dot determination unit 4 comprises a dividing unit 40 for dividing image data into large blocks of a prescribed size and further subdividing the large blocks into multiple smaller blocks. For example, as described in paragraphs [0025]-[0026] on pages 9 and 10 of the specification and illustrated in Figure 3, the dividing unit 40 divides the image data into large blocks having a size of M x N pixels, and further divides the large blocks into smaller blocks 1 through 5 having a size of (i) x (j) pixels.

As illustrated in Figure 2, for example, the disclosed embodiment also comprises a large block isolated point calculation unit 46 for calculating a number of isolated points contained in each large block established by the dividing unit 40. In addition, as illustrated in Figure 2, the disclosed embodiment also comprises a small

[1] For the convenience of the Examiner and to illustrate support for the features of the present invention, references are made herein to exemplary embodiments described in the specification and the drawings. The references used herein are not intended to limit the claimed invention to the referenced embodiments.

block isolated point calculation unit 41-45 for calculating a respective number of isolated points contained in each small block 1 through 5 established by the dividing unit 40.

Furthermore, the disclosed embodiment comprises a halftone-dot region determination unit 47-49 for determining whether or not a large block is a halftone-dot region. As described in paragraph [0031], the halftone-dot region determination unit 47-49 determines that a large block is a halftone-dot region if the following two conditions are satisfied: (1) all small blocks contained in the large block have an isolated point contained therein, based on the respective number of isolated points that are calculated for each of the small blocks, and (2) the number of isolated points calculated to be contained in the large block is greater than or equal to a first prescribed value (e.g., threshold value illustrated in Figure 2).

Independent claims 1, 6, 11 and 14 recite various features of the above-described exemplary embodiments. Claims 1 and 6 recite an exemplary apparatus, and claims 11 and 14 recite an exemplary method.

Claims 1 and 6 each recite an image processing apparatus that comprises a halftone-dot region determination unit for determining whether or not a specified large block is a halftone-dot region.

Claim 1 recites that the halftone-dot region determination unit determines that a specified large block among the large blocks established by the dividing unit is a halftone-dot region if <u>all small blocks in the specified large block have an isolated point contained therein</u>, based on the respective second numbers calculated by the small block isolated point calculation unit, and if the first number of isolated points calculated to be contained in the specified large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value.

Claim 6 recites that the halftone-dot region determination unit determines that the large block is a halftone-dot region if <u>all small blocks in the large block have an isolated point contained therein</u>, based on the respective first number of isolated points calculated by the small block calculation unit, and if the second number of isolated points calculated to be contained in the large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value.

The methods of claims 11 and 14 recite steps corresponding to the constituent elements of the image processing apparatuses of claims 1 and 6, respectively.

To establish a *prima facie* case of obviousness, the applied reference(s) must disclose or suggest all the claimed features. See MPEP 2142; 706.02(j). If the applied references fail to disclose or suggest one or more of the features of a claimed invention, then the rejection is improper and must be withdrawn.

Applicants respectfully submit that Ohuchi does not disclose or suggest all the recited features of independent claims 1, 6, 11 and 14 for the following reasons.

Ohuchi discloses an apparatus and method for discriminating a dot region of an image contained in a digital input image signal. The input image signal is generated by making a raster scan of a document image in which a dot image (e.g., a photograph) and a line image (e.g., a character) coexist. An input image processing part 11 stores a quantity of the received input image signal amounting to a predetermined number of scan lines that are required to discriminate the dot region. For example, the input image signal amounting to N x 3 scan lines are stored, where N denotes a number of picture elements that determines a unit block B comprising N x N picture elements for detecting the dot region (see Column 17, lines 52-66, and Figure 3).

With reference to Figure 3, Ohuchi discloses that an extreme point detecting part 12 receives the input image signal from the input image processing part 11 and successively applies a predetermined matrix comprising M x M picture elements with respect to each picture element m included in the input image signal. Figure 4A of Ohuchi illustrates a matrix comprising 3 x 3 picture elements (m_0 to m_8), Figure 4B illustrates a matrix comprising 4 x 4 picture elements (m_0 to m_{15}), and Figure 4C illustrates a matrix comprising 5 x 5 picture elements (m_0 to m_{24}). Ohuchi discloses that the extreme point detecting part 12 detects whether or not a center picture element m_0 of the matrix M x M is an extreme point that indicates a peak or valley of the density change based on the density relationships with surrounding picture elements m_1 through m_i ($i = M^2 - 1$) (see Column 17, line 66 to Column 18, line 14).

With reference to Figure 3, Ohuchi discloses that a dot region detecting part 13 divides the image described by the input image signal into blocks B each

comprising N x N picture elements, subdivides each block B into a plurality of small regions C_i, and counts the number of extreme points indicating the valleys for each small region C_i of each block B. Figure 5 of Ohuchi illustrates a case where N=9 and the block B comprises 9 x 9 picture elements, and Figure 16 illustrates a case where i=4 and each block B is subdivided into four smaller regions C_1, C_2, C_3 and C_4. The dot region detecting part 13 discriminates whether or not a predetermined picture element within the object block B_0 (see Figure 6) belongs to the dot region, <u>based on the relationship between a number P_0 of extreme points of the object block B_0 and numbers P_1 through P_8 of extreme points of surrounding blocks B_1 through B_8</u> (see Column 18, lines 15-31). In particular, with reference to steps S41-S45 illustrated in Figure 17, Ohuchi discloses that each block B is subdivided into the small regions C_1 through C_4, and a number q of extreme points is obtained for each of the small regions C_1 through C_4. Step S42 determines the number Q of small regions C_i in which q=0 for each block B with respect to both the peak and valley. Step S43 discriminates whether Q is greater than a predetermined value Q_{TH}. If $Q>Q_{TH}$, step S44 sets the number P of extreme points of the block B to P=0. On the other hand, if $Q \le Q_{TH}$, step S45 obtains the sum of the numbers of q for the peaks and valleys, and sets the larger sum Σq as the number P of extreme points in this block B (see Column 20, lines 39-52).

With reference to Figure 3, Ohuchi discloses that a region discrimination signal output part 14 outputs a discrimination signal that indicates whether each picture element belongs to the dot region or the line region based on the result of the detection made in the dot region detecting part 13 (see Column 18, lines 32-36). As described above, the dot region detecting part 13 of Ohuchi discriminates whether or not a predetermined picture element within an object block B belongs to the dot region <u>based on the relationship between a number P_0 of extreme points of that object block B and numbers P_1 through P_8 of extreme points of the surrounding blocks</u> (see Column 18, lines 15-31).

Accordingly, Ohuchi discloses that the number P_B of extreme points in regions C_1 to C_i of block B are counted (see steps S41 to S45 in Figure 17), and the number P_B of extreme points of that block B are compared with the number P_1 through P_8 of extreme points of the surrounding blocks. Thus, Ohuchi discloses that the

determination of whether block B belongs to the dot region is dependent on the number of extreme points in block B in comparison with the number of extreme points of the surrounding blocks B_1 to B_8.

Therefore, in contrast to the claimed invention, Ohuchi does not disclose or suggest a technique that can determine whether a specified large block is a half-tone dot region without having to also determine whether neighboring blocks constitute a half-tone dot region. On the contrary, in the process of Ohuchi, <u>the dot region determination is executed repeatedly for all picture elements</u> (see steps S6, S7 and S8 in Fig. 17. Corresponding steps are also included in the flowcharts of Figs. 8, 12 and 15). This is a foundational distinction between the claimed invention and Ohuchi. The claimed invention enables a determination of whether a specified large block is a halftone-dot region, whereas Ohuchi requires the entirety of an image to be analyzed to determine whether an object block B is a halftone-dot region.

In contrast to the claimed invention, Ohuchi does not disclose or suggest that a halftone-dot region determination unit determines that a specified large block among the large blocks established by the dividing unit is a halftone-dot region if <u>all small blocks in the specified large block have an isolated point contained therein</u>, based on the respective second numbers calculated by the small block isolated point calculation unit, <u>and if the first number of isolated points calculated to be contained in the specified large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value</u>, as recited in claim 1. Ohuchi also does not disclose or suggest the corresponding determining step as recited in the method of claim 11.

Similarly, Ohuchi does not disclose or suggest that a halftone-dot region determination unit determines that the large block is a halftone-dot region if <u>all small blocks in the large block have an isolated point contained therein</u>, based on the respective first number of isolated points calculated by the small block calculation unit, <u>and if the second number of isolated points calculated to be contained in the large block by the large block isolated point calculation unit is greater than or equal to a first prescribed value</u>, as recited in claim 6. Ohuchi also does not disclose or suggest the corresponding determining step as recited in the method of claim 14.

Kingetsu was applied by the Office in an attempt to arrive at a feature which is no longer recited in claims 1, 6, 11 and 14. Nevertheless, similar to Ohuchi, Kingetsu does not disclose or suggest the halftone-dot region determination units of claims 1 and 6 and the corresponding determining steps of claims 11 and 14.

Therefore, no obvious combination of Ohuchi and Kingetsu can arrive at the subject matter of claims 1, 6, 11 and 14, since Ohuchi and Kingetsu, either individually or in combination, fail to disclose or suggest all the recited features of claims 1, 6, 11 and 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that claims 1, 6, 11 and 14 are patentable over Ohuchi and Kingetsu.

Dependent claims 2-5, 7-10, 12, 12 and 15-25 recite further distinguishing features over Ohuchi and Kingetsu. The foregoing explanation of the patentability of independent claims 1, 6, 11 and 14 is sufficiently clear such that it is believed that separately arguing the patentability of the dependent claims is unnecessary at this time. However, Applicants reserve the right to do so if it becomes appropriate.

IV. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. Accordingly, Applicants request a favorable examination and consideration of the instant application.

If, after reviewing this Amendment, the Examiner believers there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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